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AI-Powered Sagittal Spine Segmentation and Automated Analysis from X-ray Images for Spinopelvic Parameter Assessment

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Introduction

The assessment of spinal and pelvic parameters plays a pivotal role in diagnosing and treating various orthopedic conditions, particularly those related to the spine and pelvis. Traditional methods of assessing these parameters from X-ray images have relied heavily on manual measurements and visual inspections by medical professionals. However, with the rapid advancement of Artificial Intelligence (AI) and machine learning, there is a growing shift towards automating this process. In this article, we explore the application of AI-powered sagittal spine segmentation and automated analysis from X-ray images for spinopelvic parameter assessment, highlighting its benefits and implications for orthopedic practice [1,2]. Spinopelvic parameters are essential measurements that provide insights into the alignment and balance of the spine and pelvis. They play a crucial role in the evaluation and management of various orthopedic conditions, including scoliosis, spondylolisthesis, and degenerative disc disease [3].

Description

The integration of artificial intelligence into healthcare imaging has revolutionized the way medical professionals analyze and interpret radiological data. Machine learning algorithms, particularly deep learning techniques, have demonstrated exceptional capabilities in image segmentation, object recognition, and quantitative analysis. In the realm of orthopedics, AI has the potential to enhance the accuracy, efficiency, and objectivity of assessing spinopelvic parameters. Sagittal spine segmentation is a critical step in automating the assessment of spinopelvic parameters from X-ray images. The segmentation process involves the identification and delineation of spinal structures, such as vertebrae and intervertebral discs. AI-powered segmentation models leverage convolutional neural networks (CNNs) and advanced algorithms to accurately segment the spine, creating a digital representation of its morphology. The integration of AI-powered sagittal spine segmentation and automated spinopelvic parameter assessment is poised to transform the field of orthopedic imaging. This technology promises to enhance the accuracy, efficiency, and objectivity of assessing spinal and pelvic parameters, leading to better patient outcomes and more streamlined clinical workflows. The assessment of spinopelvic parameters is of paramount importance in understanding and treating various spinal conditions. These parameters, such as lumbar lordosis, pelvic tilt, and sacral slope, provide crucial insights into spinal health and alignment. Traditionally, assessing spinopelvic parameters involved manual measurements and radiological expertise [4,5]. However, recent advancements in artificial intelligence (AI) have paved the way for automated segmentation and analysis of sagittal spine images, making the process faster, more precise, and accessible to a broader range of healthcare professionals. In this article, we explore the significance of spinopelvic parameters, the role of AI in segmenting and analyzing sagittal spine images, and the potential impact on clinical practice [6].

Conclusion

In the future, we can expect further refinements in AI algorithms, improved integration of AI solutions into healthcare systems, and an increased focus on data quality and regulatory compliance. Orthopedic practitioners will continue to play a central role in interpreting AI-generated measurements and making clinical decisions based on this data. In conclusion, AI-powered sagittal spine segmentation and automated analysis of spinopelvic parameters from X-ray images offer an exciting opportunity to enhance the precision and efficiency of orthopedic practice. As the healthcare industry continues to embrace AI technologies, patients can look forward to more accurate diagnoses and treatment plans, ultimately improving their quality of life. The future of orthopedic imaging is bright, and AI is leading the way towards a new era of healthcare. Understanding these parameters is essential for diagnosing and treating spinal disorders, such as spondylolisthesis, spinal deformities, and degenerative disc diseases. Traditionally, the measurement of spinopelvic parameters required labor-intensive manual work, which was prone to human error and time-consuming. However, AI has brought about a significant transformation in this field.

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Conflict of Interest

None.

References

1. Tartara, Fulvio, Diego Garbossa, Daniele Armocida and Giuseppe Di Perna, et al. "Relationship between lumbar lordosis, pelvic parameters, PI-LL mismatch and outcome after short fusion surgery for lumbar degenerative disease. Literature review, rational and presentation of public study protocol: RELApSE study (registry for evaluation of lumbar artrodesis sagittal alignEment)." *World Neurosurg: X* (2023): 100-162.

2. Scheer, Justin K., Jessica A. Tang, Justin S. Smith and Frank L. Acosta, et al. "Cervical spine alignment, sagittal deformity and clinical implications: A review." *J Neurosurg Spine* 192 (2013): 141-159.

3. Barrey, Cedric, Jerome Jund, Gilles Perrin and Pierre Roussouly. "Spinopelvic alignment of patients with degenerative spondylolisthesis." *Neurosurgery* 61 (2007): 981-986.

4. Knott, Patrick T., Steven M. Mardjetko and Fernando Techy. "The use of the T1

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sagittal angle in predicting overall sagittal balance of the spine." *J Spine* 10 (2010): 994-998.

5. Vrtovec, Tomaz and Bulat Ibragimov. "Spinopelvic measurements of sagittal balance with deep learning: Systematic review and critical evaluation." *Eur Spine J* 31 (2022): 2031-2045.

6. Orosz, Lindsay D., Fenil R. Bhatt, Ehsan Jazini and Marcel Dreischarf, et al. "Novel artificial intelligence algorithm: An accurate and independent measure of spinopelvic parameters." *J Neurosurg Spine* 37 (2022): 893-901.

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